WHAT IS CLAIMED IS:

1. A flow-through capacitor comprising a positive electrode having a capacitance value C+, and a negative electrode having a capacitance value C-, wherein the overall capacitance C_T is defined by:

$$1/C_T = (1/C+) + (1/C-),$$

further wherein the value of C+ and C- differ sufficiently to form an asymmetrical capacitor

2. The flow-through capacitor as in claim 1, wherein the positive electrode and the negative electrode comprise similar materials.

3. The flow-through capacitor as in claim 2, wherein the positive electrode and the negative electrode comprise high surface area conductive constituents.

4. The flow-through capacitor as in claim 3, wherein the high surface area conductive constituents are supported on substrates.

5. The flow-through capacitor as in claim 4, wherein the substrate is electrically conductive.

6. The flow-through capacitor as in claim 4, wherein the substrate is electrically non-conductive.

7. The flow-through capacitor as in claim 5 or 6, wherein the high surface area conductive constituents are impregnated in rigid sponge substrates.

8. The flow-through capacitor as in claim 5, wherein the high surface area conductive constituents are impregnated in rigid sponge substrates.

9. The flow-through capacitor as in claim 3, wherein the high surface area conductive constituents are selected from the group of materials consisting of graphite, activated carbon particles, activated carbon fibers, activated carbon particles formed integrally with a binder material, woven activated carbon fibrous sheets, woven activated carbon fibrous cloths, non-woven activated carbon fibrous sheets, non-woven activated carbon fibrous cloths; compressed activated carbon particles, compressed activated carbon particles fibers; azite, metal electrically conductive particles, metal electrically conductive fibers, acetylene black, noble metals, noble metal plated materials, fullerenes, conductive ceramics, conductive polymers, or any combination comprising at least one of the foregoing materials.

10. A flow-through capacitor as in claim 1, wherein the positive electrode and the negative electrode comprise different materials.

11. The flow-through capacitor as in claim 10, wherein the positive electrode or the negative electrode comprise high surface area conductive constituents.

12. The flow-through capacitor as in claim 11, wherein the high surface area conductive constituents are supported on substrates.

13. The flow-through capacitor as in claim 12, wherein the substrate is electrically conductive.

14. The flow-through capacitor as in claim 12, wherein the substrate is electrically non-conductive.

15. The flow-through capacitor as in claim 13 or 14, wherein the high surface area conductive constituents are impregnated in rigid sponge substrates.

16. The flow-through capacitor as in claim 13, wherein the high surface area conductive constituents are impregnated in rigid sponge substrates.

17. The flow-through capacitor as in claim 11, wherein the high surface area conductive constituents are selected from the group of materials consisting of graphite, activated carbon particles, activated carbon fibers, activated carbon particles formed integrally with a binder material, woven activated carbon fibrous sheets, woven activated carbon fibrous cloths, non-woven activated carbon fibrous sheets, non-woven activated carbon fibrous cloths; compressed activated carbon particles, compressed activated carbon particles fibers; azite, metal electrically conductive particles, metal electrically conductive fibers, acetylene black,

noble metals, noble metal plated materials, fullerenes, conductive ceramics, conductive polymers, or any combination comprising at least one of the foregoing materials.

18. The flow-through capacitor as in claim 11, wherein the opposing electrode is a gas evolving electrode.

19. The flow-through capacitor as in claim 11, wherein the opposing electrode is a chlorine evolving electrode.

20. The flow-through capacitor as in claim 11, wherein the opposing electrode is selected from the group of materials consisting of graphite or dimensionally stable anodes.

21. An asymmetrical flow through capacitor comprising positive electrode having a capacitance value C+ and a negative electrode having a capacitance value C-, wherein the capacitance value C+ is sufficiently large so that the expression 1/C+ approaches zero, wherein the overall capacitance C_T is

$$1/C_T \approx 1/C-.$$

22. An asymmetrical flow through capacitor comprising positive electrode having a capacitance value C+ and a negative electrode having a capacitance value C-, wherein the capacitance value C- is sufficiently large so that the expression 1/C- approaches zero, wherein the overall capacitance C_T is

$$1/C_T \approx 1/C+.$$

23. An electrode for a flow through capacitor, comprising channels therein for fluid flow.

24. An electrode-separator assembly, comprising an electrode including channels therein for fluid flow, and a separator laminated or otherwise integrally formed with the electrode.

25. A flow-through capacitor comprising a movable electrode and a gas evolving electrode.

26. The flow-through capacitor as in claim 25, wherein the movable electrode is a negative electrode for attracting sodium ions from a sodium chloride solution and the gas evolving electrode is a positive electrode for evolving chlorine gas.

27. The flow-through capacitor as in claim 25, wherein the capacitance of both electrodes is substantially unlimited.